# Legislative Council Sessional Committee Government Administration B

# **Integrated Transport Options**

Submission by

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### Introduction.

The viability of public transport is a complex interaction among four distinct sub-systems:

- (a) people's demands for the benefits of travel
- (b) land use distribution patterns
- (c) institutional constraints, and,
- (d) the supply of transport modes and the costs associated with them.

People expressing an opinion on public transport overwhelmingly tend to focus solely on the fourth of these factors, namely, the supply of transport modes, and they usually ignore or understate the costs associated with them.

Yet the single most important factor determining the viability and effectiveness of public transport is its ability to satisfy people's demands for the benefits of personal travel, given changing patterns of land use distribution and institutional constraints.

#### People's demands for the benefits of travel.

Travel is a derived demand. Travel is undertaken only if the perceived benefits outweigh the anticipated costs in time, money and effort incurred to secure those benefits.

At any given time there is a considerable amount of unfulfilled "latent travel"; potential travel reluctantly forgone because the opportunities to derive the benefits of travel are outweighed by the greater costs (in time, money and effort) of achieving them.

For example, a common criticism of, say, building a new bridge to improve the road network is that it leads to an increase in road use and is therefore self-defeating by not reducing existing traffic volumes. Such a criticism is irrational. To the extent that the costs of travel have been reduced by the new bridge, a proportion of unfulfilled latent travel is now able to be satisfied by those able to take advantage of lower travel costs. The only valid question is whether or not the aggregate new benefits to individuals and society outweigh the total costs of the new bridge, taking into account relevant financial, social and environmental factors.

Travel demand factors have changed considerably in recent decades due fundamentally to the shift from a declining industrial workforce dominated by manufacturing to an emerging post-industrial workforce based on the expansion of tertiary (semi-skilled) and increasingly quaternary (skilled) services.

When mechanised public transport systems were first developed in the latter half of the 19<sup>th</sup> Century the workforce was overwhelmingly male, working hours were routinely "clock-in, clock-off", and the working week, as with other aspects of industrial age employment, was rigid and regulated. Those conditions were ideal for the mass transit aspects of public transport, enabling large numbers of workmen to be ferried to and from centralised workplaces at predictable times. They continued in all developed countries until a decade or so following the end of World War 2.

The emergence of the post-industrial era from about 1950 has resulted in considerable changes to travel demands due to:

- (a) the shift to service employment
- (b) the entry into paid employment by women, especially women with dependent children
- (c) deregulated employment conditions and more flexible working hours
- (d) the growth of part-time work and opportunities to work from home, and,
- (e) the growth of car ownership.

The shift from manufacturing to service employment has seen the dominant focus of work changing from relationships between men and machines to relationships between men and women interacting with their clients and customers.

The entry into paid employment, combined with personal access to a private car, has given women, especially mothers of dependent children, the freedom to participate in the workforce while still attending to household and home responsibilities. Juggling work and home duties within the tight confines of a daily time budget is, for most working women, possible only because of the time-space expanding opportunities presented by the private car. For most housewives, paid employment would not be possible without the use of personal motorised transport to get them to and from work, to attend to private business commitments, to assist children with school and out-of-school activities, to transport bags of shopping, to participate in visiting friends and relatives, and to engage in social activities.

The emerging post-industrial society promotes greater flexibility. Sport is no longer confined to Saturday afternoons, nor Church attendance to Sunday mornings. People are increasingly paid to do a job rather than be paid just to attend a workplace. Shopping and banking hours are no longer confined to fixed times and fixed places. Working hours are more flexible than they used to be. "Flexing" on and off is now widespread and an increasing number of employees are opting to work from home rather then from a fixed workplace. Part-time and casual work is increasing relative to full-time work, as is working "on the road" servicing and interacting with clients and customers.

People's travel demands are affected by stages in the demographic life cycle. As children grow they learn to use various modes of personal transport, such as tricycles, bicycles, scooters, skateboards and rollerblades. Teenagers aspire to pass tests allowing them to drive motor cars. The independence of young adulthood generates a new set of personal travel demands associated with education and social needs. Marriage and raising a family create demands for larger residential and recreational space, typically found in low density suburbs. When adult children leave home the travel patterns of "empty nester" parents undergo change. For the elderly, proximity and easy access to medical services assumes greater importance.

The net result of all these changes is that travel demands are becoming increasingly complex and far more dispersed in time and space. The Travel Survey for Northern Ireland, 2006-2008, for example, found that commuting trips made up only 16% of all trips compared with 22% for leisure purposes (recreation, education and visiting friends) and 21% for shopping.

#### Land use distribution patterns.

In their book "Access For All: Transportation and Urban Growth" K H Schaeffer and Elliot Sclar refer to the pre-industrial city, prior to the development of mechanised transport, as the "walking city", the public transport city of the industrial age as the "tracked city" and the car dominated city of the post-industrial era as the "rubber city".

Walking cities were small, compact and crowded. Land uses were concentrically focussed around a central city square, market place and sites of government and religious worship. Travel was by walking or animal powered carriages and land uses were mixed together with more vertical than horizontal separation.

The development of mechanical transportation in the industrial age allowed for the horizontal separation of residences from workplaces and the development of suburbs along the radial routes of heavy and light train lines. Land uses in tracked cities were more differentiated although still focussed on a dense and crowded central business district. Routes connecting the city centre to outlying suburbs extended predominantly along flat transport corridors.

Widespread motor car ownership following World War 2 and the growth of the service based post-industrial workforce radically transformed urban land use patterns. For the first time workers' choices of where to live were no longer highly constrained by where they worked. Residentially attractive sites, such as elevated hill slopes with views, or beach and river frontages, or quiet bushland settings, or, especially, cheap land in the interstices between the radial train and tram tracks or in new developments at the edges of the urban area became available for purchase. The motor car has become the flexible link that made these previously unavailable home sites possible. Thus, modern cities throughout the western world, and increasingly in developing countries, are experiencing a massive low density outward spread reflecting people's desires of where to live given the opportunities afforded by car ownership.

Non residential land uses, manufacturing, retail, office and recreational sites have followed this outward low density development. The city centre has declined in relative importance as a focus of urban orientation. Regional shopping centres and special establishments such as universities, sporting arenas, cultural hubs and other land uses act as a set of multiple nuclei, each with its own particular focus. Freight transport, revolutionised by the introduction of containerisation, has followed a similar trend. As a result, large areas of the inner city previously dedicated for freight shipping have become available for residential use.

Opportunities to enter highly paid quaternary professional employment have encouraged women to marry later, if at all, and to have fewer children later in life. The decline in birth rates, combined with increasing longevity due to healthier lifestyles, has led to an increasing aging of society. The elderly, as well as independent young adults, show a growing propensity to reside in the inner city, preferring to live in renovated industrial sites at higher densities in return for easier access to urban amenities. Despite this important trend, the dominant overall trend is for low density suburban development to continue due to the large space demands of families entering the child bearing stages of the demographic life cycle.

## Institutional constraints.

The viability and effectiveness of transport systems are crucially affected by institutional constraints such as:

- (a) government policies in regard to planning, regulation, funding and safety
- (b) natural factors, such as topography, river systems and coastal locations
- (c) cultural and heritage constraints
- (d) technological developments, and,
- (e) ideologically prescribed planning paradigms.

Governments have always been concerned with how transport systems are organized and conducted, not only to facilitate efficient passenger and freight movements but to protect and enhance what they regard as "the public good".

Certainly, no one could dispute the important role of governments in the planning of transport infrastructure, or in regulating common practices, such as road rules and vehicle design, or in establishing rules to promote safety, such as seat belt legislation, road speed limits, blood alcohol limits, cycling helmets and vehicle safety inspections.

But governments are open to criticism when their involvement in transport extends to regulations that affect the market structure of transport systems or when they use fiscal and taxation measures to promote or favour certain forms of transport over others.

Generally, transport services confer private benefits on identifiable firms or individual citizens. Overall the public good is generally better served by Adam Smith's "invisible hand" than by government coercion in response to the lobbying of vested interests.

Thus, for example, a more efficient and equitable network of arterial roads would result if roads were funded directly by road user charges rather than by taxpayer funding based on prospective electoral patronage.

Similarly, regulations restricting the number of taxi licences and taxi fares are enforced with the aim of protecting the taxi industry rather than the needs of the passengers they serve.

The establishment of Metro Tasmania as a monopoly government business enterprise is another example of government regulation imposed to enforce a particular market structure.

Natural factors play an important role in determining the effectiveness and viability of different transport systems. The difficulty for tracked rail systems to climb hills or descend steep slopes meant that in Hobart industrial age land uses were largely confined to the flat transport corridors extending from Sullivans Cove upstream on the western side of the Derwent River. It was only with the advent of motor cars and buses, together with the construction of roads and cross-Derwent bridges, that highly attractive sites on the eastern shore, on the urban periphery, and on the hill slopes of the western shore became available for residential and commercial development. Similarly, topographical constraints and the lack of

an arterial bypass around the western side of the CBD means that inter-regional road traffic in Hobart is necessarily funneled along the arterial twin routes of Davey and Macquarie Streets.

Cultural and heritage factors, comprising large areas of pre-industrial land surrounding the cores of inner cities, affect the planning of transport systems of many European countries.

However, apart from the naturally protected precincts of Battery Point and Glebe, and isolated sites in West, South and North Hobart, the Hobart urban area, in keeping with most other comparable cities in the "new world" countries of Canada, Australia, New Zealand and USA ("CANZUS") does not contain large areas of pre-industrial urban heritage needing protection from transport development.

Technological developments, particularly recent advances in electronics, have greatly facilitated traffic management. For example, theoretical solutions to "civilizing" car use by requiring the driver to pay for congestion and other externality costs was well developed in the 1950s but was impossible to implement because the technology to do so was not available. Today, electronic signalling between cars to roads and from cars to cars, together with electronic fund transfers, now makes it possible to put these theoretical prescriptions into practice. All that is required is government will and a reform of planning paradigms.

Since the 1960s planning paradigms in developed countries have taken an aggressive anti-car approach, based on the false assumptions that:

- (a) the externality costs associated with motor car use (principally congestion, pollution and road trauma) are intrinsic to motor vehicle use and can not be managed other than by throwing the baby out with the bath water, and,
- (b) other modes of transport, particularly mass transit systems can adequately substitute for private motor vehicle use.

Urban planners usually defend these false assumptions by incorrectly disaggregating complex daily activity patterns into sets of separate, discrete trips, such as "journeys to work". "journeys to shop", etc. In reality, most people do not make sets of discrete trips but rather one or more daily journeys each consisting of a series of interrelated linked trips (or "chains" as they are sometimes called). On going to bed at night most people have some idea of what activities they would like to do tomorrow. Some trips may be essential, like going to and from work, while others may be discretionary, like going to see a sick relative or meeting up with an old friend. Some necessary trips, like shopping for a new pair of shoes, but may be deferred until another day. Activities need to be carefully planned in terms of when, where and how the separate activities can be coordinated into the person's available time budget. Importantly, if any one link in the journey chain requires the services of a car, then the car has to be available at the time, it cannot be left behind in the garage at home. This simple example shows why seemingly simple policies such as "car pooling" or "park and ride" schemes break down in practice. In our post-industrial culture of increasingly time- and space-dispersed activities, less and less do we live near to people with work with or work with people we live near, and more and more we engage in complex daily journeys involving separate links that are highly time- and space-constrained.

Due to their anti-car ideology urban planners irrationally tend to classify transport modes into private car use on the one hand and every other conceivable mode of transport (walking, cycling, bus, train, ferry, or whatever) on the other.

A more useful classification distinguishes between personal modes (walking, pedal cycling, motor cycling, scooting, motor scooting, skateboarding, rollerblading and automobiling) on the one hand and public transport modes (buses, trolley buses, light rail, heavy rail, ferries, et al) on the other. The essential difference in the dichotomy is that travel decisions (how to go, where to go, when to go) for personal modes are made by the individual traveller whereas public transport decisions are made by a third party, the operator of the system. To access public transport potential passengers have to present themselves at particular locations at particular times to travel on specific routes at designated fares on vehicles whose design and comfort levels are determined by the operator.

Further evidence for the ideological anti-car sentiment among urban planners are the repeated references in planning documents to the car as an animate object, rather than as an inanimate collection of metal and fabric, the persistent use of terms such as 'car dependence', implying motor car use as an irrational and possibly addictive behaviour, and explicit recommendations to "reduce" car use, rather than to optimise or reduce unnecessary travel.

As an urban geographer and transport economist I find the ubiquitous use of such terms to be offensive and unprofessional yet they abound and seem to be used as a deliberate and smug badge of pride within the urban planning profession.

A further paradigm failure is the planning prescription to recreate high density "urban villages" to promote public transport at the expense of motor car use. If it was politically feasible in a democratic society, enforced higher densities would lead to higher land prices and increased crowding. In order to pay high rents, low income families would be forced to reside in cramped conditions to live close to urban amenities, recreating old industrial slum conditions. Central to the urban village concept is to restrict people's choices to the facilities offered locally; that is, the local butcher, the local hairdresser, the local pub and the local coffee shop. Such a concept is the antithesis of what makes urban living attractive to people, the opportunity to exercise choice in our purchases and social interactions. It is not only our choice of a favourite coffee shop or hairdresser that is relevant. Car ownership gives people greater opportunities to find satisfying jobs, to gain access to medical services, and to participate in a richer range of life enhancing experiences.

It should be emphasised that motor car ownership has been the single greatest factor enabling ordinary working families to live in comfort and security and to enjoy the opportunities previously only available to the wealthy.

Car use not only provides private benefits to individuals. It generates external benefits leading to economic growth. Consumer choice promotes competition which in turn encourages innovation and efficiency. Taken to its limits, the urban village concept would stifle choice and replace innovation and efficiency with a "take it or leave it" attitude.

## The supply of transport modes and the costs associated with them.

With the above general principles in mind it is appropriate to consider specific proposals relating to current and potential innovations within Hobart and southern Tasmania.

#### (a) Personal transport modes.

It is debatable whether or not walking should be regarded as a distinct mode of transport. Nevertheless, the trend to encourage walking instead of relying on mechanical means of transport is welcome, and policies should be implemented to make it safe and enjoyable.

The same can be said for pedal cycling as a growing mode of transport in post-industrial societies both for commuting purposes and for recreation.

Current practices tend to confine walking and cycling to footpaths and roads adjacent to the existing road network. Forcing pedestrians and cyclists to mix with motorised transport is unsatisfactory. Cyclists, in particular, may feel physically threatened, while motorists are likely to complain if, as a tactic to achieve safety, cyclists break road rules to avoid cars.

Where practicable, an expanded network of joint cycling and pedestrian paths should be established to connect suburbs directly without following the road system. In particular, space should be provided for walking and cycling paths in new suburban developments.

The current situation where bicycle lobby groups seek to obtain cycle paths at the expense of motor traffic on arterial roads is unacceptable. Cars and bicycles are both forms of personal transport and neither mode should try to gain scarce road space at the expense of the other.

The greater speed, flexibility, comfort and freight carrying capacity of the motor car ensures that it will continue to be the preferred personal transport option for most people. Relative to other forms of personal and public transport the benefits of car use are so great that higher operating costs from fuel and congestion are unlikely to restrain its appeal.

The much publicized externality costs associated with motor vehicle use, congestion, road trauma and pollution, are all capable of being managed given the necessary policies. Congestion is a market failure shared by those who cause it, the motorists in the congested traffic stream. The solution is to charge each motorist the marginal cost of the congestion, a policy now possible with electronic pricing systems. Similarly, road accidents can be substantially reduced to minor levels by the use of computer controlled warning systems operated by car-to-car and car-to-road communications. Finally, pollution costs will be eliminated by the inevitable development of efficient and low cost electric vehicles.

Cars, or private motorised transport, confer so many benefits to private citizens and to national economies that their use is increasing throughout the world, particularly in developing countries. Eventually, as in the USA currently, car ownership and use will reach saturation levels, but that is unlikely to occur worldwide for decades to come.

#### (b) **Public transport systems.**

Public transport modes include underground rail, heavy surface rail, light rail, trolley buses, scheduled bus services, unscheduled bus services, taxis, and ferries.

The viability of different forms of public transport depends on city size (and hence potential passenger volumes), car ownership levels, and other management and institutional variables.

Substantial underground rail networks, for example, are found only in cities having several million inhabitants. High construction and high operating costs as well as high carrying capacities mean that they need large volumes of passengers for each pair of origin and destination stations to generate sufficient revenues to justify building them.

Similar considerations apply to heavy surface rail and light rail systems, though to a lesser degree. All rail systems suffer from the acute disadvantage that their routes are fixed and therefore they lack the flexibility to cater for varying travel demands.

Hobart's proposed northern suburbs light rail system, for example, would occupy a route established during the old industrial age. Residential land use in the northern suburbs has relocated on hill slopes far removed from the low lying rail line. The likely demand for the service is likely to be very small, even if fare levels were heavily subsidised.

It should be noted that until the 1970s passenger train services on the same route using dieselelectric trains not unlike the vehicles proposed for the northern suburbs railway were forced to close due to lack of patronage.

It should also be noted that no CANZUS city of less than half a million people (twice the size of urban Hobart) has, or is contemplating installing, a light rail system. All comparable CANZUS cities of which I am aware have public transport systems based on buses.

Trolley buses are intermediate in flexibility between fixed rail systems and bus systems. However their overhead wire network makes them unsuited to cities the size of Hobart.

Bus services in Hobart are operated by Metro Tasmania, established by the State government as a monopoly provider. All bus systems are faced with a number of crucial supply side decisions that affect passenger demands for its services. These decisions represent a number of management trade-offs, between the economies of scale of mass transit versus a wider coverage of services and between large buses providing express travel speeds along arterial roads at peak times for commuters versus smaller buses providing a wider coverage at slower speeds on suburban streets at off-peak times for non commuters.

Other service considerations affecting potential bus passenger demands include frequencies, routes, comfort levels and fare structures.

Bus services are not natural monopolies. The ratio of fixed to variable costs suggests that the most likely market structure for the industry is a contestable oligopoly. Therefore, the above

trade-offs are likely to be better managed by a competitive market structure where initiative and innovation can lead to efficient and effective outcomes.

I would therefore recommend that Metro Tasmania services in Hobart be devolved into smaller units focussed on each of the local regions of the eastern suburbs (under the control of the Clarence and Sorell councils), northern suburbs (Glenorchy and Brighton), southern suburbs (Kingborough and Huon) and the central city area of Hobart. Under this proposal, regional bus services would be sub-contracted to private operators to provide service levels (routes, frequencies, and quality controls) specified by the respective local government authorities. The relevant local authority would also determine the level of rate payer subsidy, if at all, given to the successful tenderer. In this way, each region would benefit from the initiatives and innovations instigated by the other regional authorities.

Despite devolution, scheduled bus systems still suffer from the necessity to provide scheduled services on designated routes at specific times and with standard fare structures. To increase the market for bus passengers a more flexible system needs to be introduced.

This can be achieved by establishing a system of unscheduled bus services designed to fill the gap between mass transit scheduled bus services and private personal transport taxi services. Referred to, perhaps, as public on-demand (POD) transport the system is currently popular in many overseas countries having Tasmania's small size and low population density.

The POD system needs three essential components

- (a) drivers must possess a clean driving licence free of recent convictions for anti-social behaviour such as driving under the influence of drugs,
- (b) vehicles must be registered and have an annual certificate of road worthiness, and
- (c) operators must have adequate public liability insurance.

Other than these basic requirements the number of licences, fare structures, areas of operation, size and types of vehicles, and other service conditions should be left to market forces. Fares would be cheap and, unless the occupant was willing to pay an extra fee for exclusive use, the system would have shared passengers in vehicles ranging from small sedans to mini-buses.

Although POD trips would divert some passengers from buses and taxis, most trade would be new activity generated by peoples' willingness to pay for flexible on-demand services presently not available to them.

In meeting this unfulfilled market demand POD would be a new industry contributing to economic growth. Incomes earned would have an economic multiplier effect as well as generating increased taxation.

Because most POD trips would take place during off-peak periods and in areas of low density the increased traffic from POD activities is likely to have little effect on congestion.

A good deal of publicity has focussed on the possibility of introducing a fast ferry system on the Derwent River. Prima facie, one would have expected that if a fast ferry service was viable some entrepreneur would have already taken the plunge and given it a go. But apart from a low volume Bellerive to Hobart commuter service and the success of an on-demand go anywhere any time water taxi service, no one has yet stepped up to make a serious challenge to test the market.

Essentially it's a question of economics. What are the costs and who benefits? The costs of running a ferry service on the Derwent fall into three categories.

First are the shore-based infrastructure costs of jetties and associated facilities, including car parks. Jetties can be of two kinds, either enclosed and reserved for the exclusive use of ferry passengers or open and used for a variety of purposes such as berths for other river craft, recreational fishing, or simply for sitting and enjoying the views.

Enclosed jetties providing toilets, seating and other services exclusively for ferry patrons should be paid for by the operator as an integral part of the ferry service. Open jetties, benefitting the surrounding community, should be provided by local governments and leased to the ferry operator.

The second cost category comprises the capital costs of renting or constructing ferries, the provision of maintenance facilities, and the management and administration expenses needed to establish the service, while the third cost category consists of the operating expenses of fuel, labour, repairs and maintenance, which vary according to patronage and the level of service provided.

The overall level of infrastructure, capital and operating costs depends on the number, types and integration of routes. Restricting the service to core routes such as Lindisfarne, Montagu Bay, Bellerive and Hobart reduces costs but narrows the market of potential passengers. Extending the service, as has been suggested, to include far flung stops such as Bridgewater, Old Beach, Austins Ferry, Ellis Point, Wilkinsons Point, Wrest Point, Opossum Bay, South Arm, Dennes Point and Kettering would widen the market but at significantly increased cost.

The big unknowns with a fast ferry service are who would use the ferries, for what purpose, how often, when they would travel, where would they go, and how much would they be willing to pay for the experience? Ferry passengers, unlike people using private transport, can travel only at the times when the ferry operates and only to destinations along the ferry route.

A number of studies into the feasibility of introducing commuter and tourist ferry services on the Derwent have concluded that a ferry service would not be commercially viable unless it was heavily subsidized by government funding. In July 2009, for example, consultants Maunsell AECOM estimated that annual revenues on each of four trans-Derwent routes would range from 6.7% to 10.8% of total costs, a highly unprofitable outcome.

In my opinion, comparisons with ferry services in Brisbane, due to the much greater size of Brisbane compared with Hobart and the different nature of the two rivers, are not a valid guide to the feasibility of ferry services in Hobart.